1984

Validation of the Rhode Island Test of Language Structure with orally educated hearing-impaired students

Monica A. Faherty

INDEPENDENT STUDY

TITLE: Validation of the Rhode Island Test of Language Structure with Orally Educated Hearing-Impaired Students

BY: Monica A. Faherty

DATE: May 10, 1984

SPONSOR: Dr. Ann Geers

INTRODUCTION

To facilitate language acquisition in hearing-impaired children is the foremost and fundamental objective in the field of education of the deaf. Language ability is frequently described by the terms competence and performance. Competence is defined as a person's knowledge of his/her language and performance as the actual use of language to communicate ideas and intentions (Blackwell, p. 12). In evaluation and teaching, it is critical to determine a child's competence and performance levels and deficits. This information aids in ascertaining a program or class placement and/or appropriate language instruction for a child (Blackwell, p. 165).

However, the ability to measure competence directly does not exist in the field of language assessment. A child's performance is observed or tested and based on this data inferences are drawn about his/her competence. Caution must be taken in drawing these inferences for hearing-impaired children for the following reasons. First, their performance is typically characterized by many omissions and incorrect uses of words and structures (Blackwell, p. 154). Are these errors for a particular child caused by competence or performance deficits or both? For example, while saying the phrase "two hands" a child may omit the "s". Is this the result of an articulation error since the final blend in "hands" /ndz/, is difficult or a competence error because the child did not understand the usage of the plural morpheme? Second,the quantity and quality of a hearing-impaired child's linguistic performance frequently depends on with whom he/she is communicating. For example, it is common to see one hearing-impaired child ask another a question using a one or two word utterance. However, that same child may use a longer and closer approximation to standard English when asking a teacher a question.

Since the oral language of hearing-impaired children develops slowly, it is important not to assume that their production of language reflects their comprehension of language, but

rather, to provide a means to measure their comprehension. The dimension of language that this paper will focus on is form or syntax. Bloom defines the syntax of a sentence as the "arrangement or order of words according to the meaning relation between them" (Bloom and Lahey, p. 15). The issues to be addressed are the measurement of the comprehension of syntax by the Rhode Island Test of Language Structures (RITLS) and the relationship of this comprehension to the use of syntax in the production of spoken English.

There is currently little information available on the development of syntactic comprehension in oral English for hearing-impaired children. For hearing children, it is generally assumed that comprehension precedes production. However, this long-held belief has been under attack in the literature. In studies that have yielded the comprehension before production conclusion, it has been found that variables, other than linguistic, may have been aiding the children on the comprehension tasks. An example is that some type of cue in the pictures or situation used aided the children. One reason that comprehension is difficult to measure is that we cannot be certain what strategies the child is using to understand (Bloom and Lahey, p. 237).

RATIONALE

There were three goals to this investigation of the RITLS:

1. To learn how the data from a group of orally-educated CID children who were administered the test orally compared to data from the children in the norm group who were in total communication programs and were administered the test in simultaneously spoken and signed English.
2. To determine the statistical correlation between the rank order of performance on the RITLS and a measure of expressive language, the Grammatical Analysis of Elicited Language-Simple and Complex Sentence Levels, for a group of severely and profoundly hearing-impaired children.
3. To analyze the individual items on the RITLS to determine whether they really measure the structures that the authors propose they do. This will determine how effectively this test measures the comprehension of syntax.

DESCRIPTION OF THE RITLS

Administration

The RITLS consists of a test booklet, a manual and response sheets. The test booklet contains 104 pages with three pictures on each page. The first four pages are example items that are used to teach the task to the child. The remaining 100 constitute the test items. The page with the three pictures faces the child. The child looks at them and then at the examiner who gives a sentence which describes one of the pictures. The child points to one of the pictures. If the child requests repetition or if the examiner feels that the child did not attend to the complete utterance, the sentence can be repeated. The child's selection is recorded on the response sheet. The total number of errors are counted. The test has been normed on five age groups of hearing-impaired children: 5-7; 8-10; 11-13; 14-16; 17+. Both percentile and standard score conversions are provided. The RITLS is a very simple test to administer and score.

Test Development

Engen and Engen (p. 1) cite two purposes for constructing this test: 1) to "provide a measure of language development that can supply significant information about a child's level of development." This information could be used to determine whether or not a syntactic comprehension problem exists. (2) The second reason is to "provide assessment data in sufficient depth and range to allow for educational planning." A child's performance on this test can give valuable information in terms of placement, language instruction and Individual Educational Plan (IEP) goals. The authors wanted this test to locate a child somewhere on the continuum of understanding structures from lesser to greater syntactic complexity. In the authors' opinion their test is an important contribution to the field of language assessment because it measures syntactic comprehension more thoroughly than any other test currently available.

Language

The vocabulary utilized in this test was pre-determined to be appropriate for the youngest group of hearing-impaired children in order to insure that comprehension of sentence structure was being assessed and not comprehension of vocabulary.

The RITLS is comprised of fifty sentences that test ten simple structures five times each and fifty sentences testing ten complex structures. An explanation and examples from the RITLS will be given for each of these twenty structures.

The first five structures are called Sentence Patterns 1, 2, 3, 4 and 5 and are the same five sentence patterns found in the 1978 Rhode Island School for the Deaf Language Curriculum (Blackwell, p. 69). They are explained in Table 1 and contain the following elements: Noun Phrase (NP), Verb Phrase (VP), Linking Verb (LV), Adjectives (Adj.) and Adverbials (Adv.).

Pattern	Language	Example
1	NP + VP or NP + VP + Adv.	The dog is running. The girl is playing in the water.
2	NP + VP + NP	The girl hit the boy.
3	NP + VP + Adj.	The bird is asleep.
4	NP + LV + NP	The building is a church.
5	NP + LV-BE + Adv.	The girl is in school.

Table 1. Explanation of Sentence Patterns 1-5.

Negatives were evaluated in two ways: by using the word not and by using the contraction n't. Examples: It is not raining. The boy can't play basketball.

Two types of passive sentences were assessed. For reversible passives, the agent and object roles can be reversed and still make sense. Example: The boy was kicked by the horse. For non-reversible passives, the agent and object roles cannot be switched. Example: The apple was eaten by the girl.

A dative is an utterance that designates the recipient of an object or action with or without a preposition. Both types were included on the RITLS. Example with a preposition: The girl sang a song for mother and father. Example without a preposition: The teacher will throw the boy the ball.

The next category is called expanded simple sentences. Example: The boy is picking apples from the tree in front of the house. These sentences are made longer by adjectives or prepositional phrases so as to be equal in length to the longest complex sentences. This category was included to determine the effect of sentence length on comprehension. The authors felt that if length was a critical factor then these sentences would be more difficult than the shorter simple sentences. However, if syntactic complexity was the critical factor then the complex sentences would be more difficult regardless of their length.

The next ten structures are at the complex level. Two types of adverbial clause sentences were assessed. In one type the main clause was at the beginning of the sentence. Example: Father cut the grass while it was raining. In the second type the subordinated clause appears initially. Example: While the dog waited the boy fixed the food.

Relative clauses which occurred in two positions in the sentences were examined. Example in the medial position: The car the man bought is old. Example in the final position: The teacher gave the book to the boy who is sitting down.

And was the only conjunction evaluated. Example: Mother fed the cat and father put the dog out.

Deleted sentences were those that had one or more words omitted. An easy example: The boy hit the girl and ran away. A harder example: The teacher gave a book to the boy but not to the girl.

In non-initial subjects, the subject of the sentence occurred in positions other than the beginning. Example: It was the truck that the car pulled.

To assess a sentence type other than declarative, the authors included imperatives embedded in sentences. Example: The policewoman says, "Stop!"

Two types of complementation were examined. The complement was the subject of the sentence (Seeing the girl jump made the boy laugh) or the object of the sentence (The girl likes to go swimming.)

Normative Data

The test was standardized on 283 hearing children between the ages of $3\frac{1}{2}$ to 7 years.

Of greater interest are the 364 children who comprised the hearing-impaired norm group. These subjects attended schools for the deaf using a total communication approach. Their geographic distribution in four Eastern states was given: North Carolina - 47%, Rhode Island - 25%, Massachusetts - 15% and New Jersey - 13%. The authors stated that in their subject selection they did not consider factors such as etiology of hearing impairment, school achievement or hearing levels. The only critical factor was the subjects' placement in schools for the deaf. No mention was made as to whether children with additional handicaps were included in this norm group.

The authors describe the hearing levels for their norm group as falling in five categories. However, they did not give their decibel ranges for these categories. So I used the hearing levels described in the GAEL-C to group the CID children and presented this in Table 2. Those children with a three-frequency average in the better ear between 70-95 dB are classified as severe and those with greater than 95 dB average are profound. Thus it appears that the subjects tested in this study were more profoundly deaf than the RITLS norm group.

	Norm Group	CID
Moderate	3	
Moderate -Severe	7	
Severe	13	25
Severe -Profound	31	
Profound	43	75
Unavailable	3	

Table 2. Percentage of children for each range of hearing level.

The RITLS was administered to these subjects by the language resource person or speech/language pathologist in the children's schools using the simultaneous mode, so each sentence was signed and spoken.

The subjects were then divided into five age groups to provide the basis for comparing data. These are 5-7; 8-10; 11-13; 14-16 and 17+.

DESCRIPTION OF GAELs

Language

The measures of expressive syntax used were the Grammatical Analysis of Elicited Language - Simple Sentence Level (GAEL-S) and Complex Sentence Level (GAEL-C). Administration of these tests is conducted through game-like activities that have been designed to elicit specific target sentences. These elicited sentences are called the prompted productions. Each target sentence is modeled by the examiner and the child imitates it. This is called the imitated production. So the child produces each sentence twice and receives two scores - one for prompted production and one for imitated production. On the GAEL-S, 94 sentences are used to assess 16 grammatical categories. These are:

1. Articles
2. Adjectives
3. Quantifiers
4. Possessives
5. Demonstratives
6. Conjunctions
7. Pronouns
8. Subject Nouns
9. Object Nouns
10. WH Questions
11. Verbs
12. Verb Inflections
13. Copulas
14. Copula Inflections
15. Prepositions
16. Negatives

The GAEL-C uses 88 sentences to assess 16 grammatical categories. These are :

1. Articles
2. Noun Modifiers
3. Subject Nouns
4. Object Nouns
5. Noun Plurals
6. Personal Pronouns
7. Indefinite and Reflexive Pronouns
8. Conjunctions
9. Auxiliary Verbs
10. First Clause Verbs
11. Other Verbs
12. Verb Inflections
13. Infinitives and Participles
14. Prepositions
15. Negatives
16. WH Questions

Standardization

The GAEL-S was normed on 200 hearing children from ages 2½ to 5 years and 200 hearing-impaired children from 5 to 9 years of age. The age groups for the hearing-impaired children are in 6-month divisions. The children were from thirteen different oral programs across the United States. All the children in

this norm group met the following criteria:

1. Hearing level (3-frequency average at 500, 1000 and 2000 Hz) in the better ear greater than 70 dB.
2. Hearing impairment acquired before two years of age.
3. Orally educated.
4. No additional handicaps of educational significance.

The GAEL-C was standardized on 240 normal hearing children from ages 3-6 years, 120 severely hearing-impaired and 150 profoundly deaf children. The 270 hearing-impaired children were from 19 different programs across the United States and included mainstreamed as well as those in special classes for the hearing impaired. The age groups on the hearing-impaired norm tables are presented in 12-month intervals. The norm group met the same criteria as the GAEL-S group, however, there were separate norm tables for severely hearing-impaired and the profoundly deaf.

DESCRIPTION OF CID GROUP

Sixteen children from CID were administered the RITLS. There were four children in each of the four age groups: 5-7; 8-10; 11-13 and 14-16. Since there were not any children at CID seventeen years of age or older, this last category was not included. The children were selected so that a range of language ability was reflected within each age group. The speech frequency averages in the better ear ranged from 80-118 dB. For the children in the two younger age groups, the test was administered in two sessions. The older children took the test in one session.

RESULTS AND DISCUSSION

RITLS Results

Since the CID children were selected so as to represent a range of language abilities, this was reflected in their percentile scores as shown in Table 3. For every age group there was a low to high range of percentile scores. The overall range was 1.3 to 99.8 and the mean was 68.

Age Group	Child	Age	RITLS %ile
14-16	Alex D.	14-7	98
	Chad W.	14-5	93.6
	Kim B.	14-6	89.4
	Chris R.	14-6	40.8
11-13	Kasey G.	12-2	98.5
	Helen Y.	12-1	92
	Chris F.	12-3	77
	Blanca G.	12-5	35.2
8-10	Eric C.	9-9	89.4
	Mike N.	9-9	71.3
	Jody B.	10-6	47.9
	Gavin B.	8-2	34.8
5-7	Chris B.	7-6	99.8
	David R.	6-9	99.5
	Mandy B.	5-8	26.4
	Tommy H.	5-1	1.3

Table 3. Percentile scores on RITLS.

Each child was then ranked by the percentage correct of the fifty simple sentences and then the fifty complex sentences. This data is given in Table 4.

Comparison to Norm Group

CID's overall performance on the RITLS is compared to

SIMPLE SENTENCES			COMPLEX SENTENCES		
Child	Age	%	Child	Age	%
Tommy H.	5-1	58	Tommy H.	5-1	34
Mandy B.	5-8	76	Mandy B.	5-8	48
Gavin B.	8-2	78	Gavin B.	8-2	66
Jody B.	10-6	78	Blanca G.	12-5	72
Blanca G.	12-5	80	Chris R.	14-6	74
Mike N.	9-9	84	Jody B.	10-6	74
Chris R.	14-6	86	Mike N.	9-9	82
Helen Y.	12-1	88	Chris F.	12-3	84
Chris F.	12-3	88	Chad W.	14-5	86
Eric C.	9-9	92	Kim B.	14-6	88
Kim B.	14-6	94	Eric C.	9-9	90
David R.	6-9	96	David R.	6-9	92
Chris B.	7-6	98	Alex D.	14-7	94
Alex D.	14-7	100	Chris B.	7-6	96
Chad W.	14-5	100	Helen Y.	12-1	96
Kasey G.	12-2	100	Kasey G.	12-2	98

Table 4. Rankings and the percentage correct for the simple and complex sentence sections.

that of the norm group. In Figure 1, we can see that the CID group had a smaller mean number of errors for each age group and that there was a larger decrease in the number of errors as their age increased than for the norm group. Figure 2 shows this was also reflected in the percentile scores assigned to the number of errors shown in Figure 1.

Each child's errors were analyzed according to sentence types for the twenty constructions tested. Table 5 shows the order of difficulty for each construction ranked from hardest to easiest for the CID group and the norm group. The rankings are very similar for both groups of hearing-impaired children.

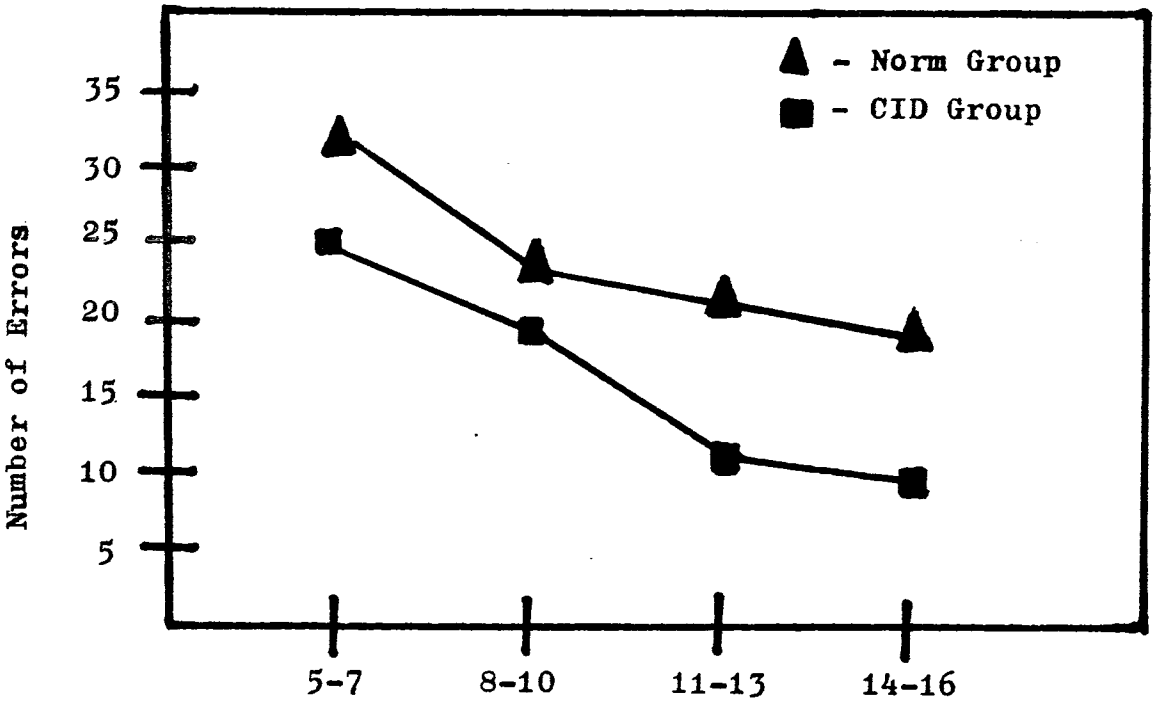

Figure 1. Mean number of errors for each age group.

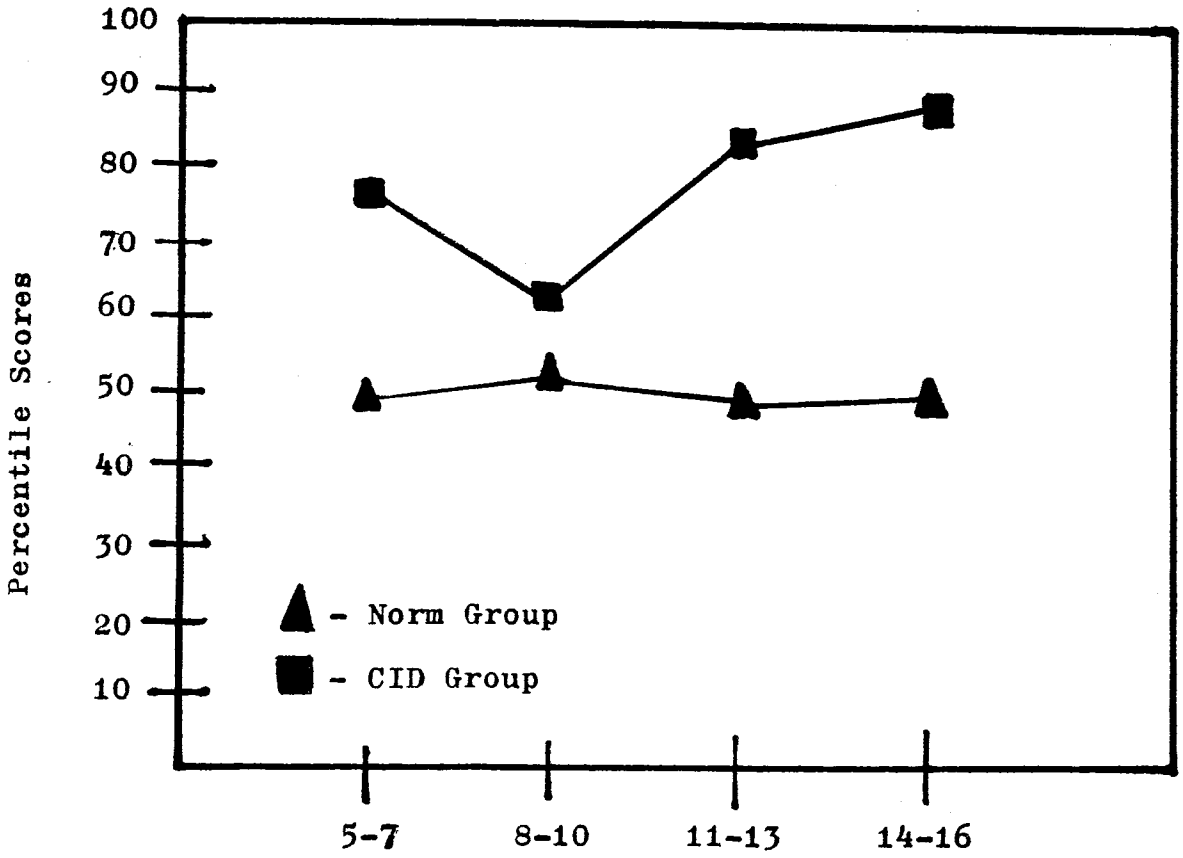

Figure 2. Percentile scores for errors shown in Figure 1.

CID Group	Norm Group
1. Reversible Passive 1. Medial Relative Clause	1. Reversible Passive
2. Negative	2. Medial Relative Clause
3. Non-initial Subject	3. Adv. Cl. - Initial Subord. Cl.
4. Adv. Cl.-Init. Subord. Cl.	4. Non-initial Subject
5. Adv. Cl.-Init. Main Cl.	5. Adv. Cl.-Initial Main Cl.
6. Final Relative Clause	6. Negative 6. Deletion 6. Final Relative Clause 6. Embedded Imperative
7. Deleted Sentences 7. Expanded Simple Sent.	7. Dative
8. Subject Complement	8. Subject Complement 8. Object Complement 8. Expanded Simple Sentences 8. Pattern 2 8. Conjunction
9. Dative	9. Nonreversible Passive
10. Conjunction	10. Pattern 4 10. Pattern 5 10. Pattern 3 10. Pattern 1
11. Object Complement	
12. Embedded Imperative 12. Nonreversible Passive	
13. Pattern 2 13. Pattern 3 13. Pattern 4	
14. Pattern 5	
15. Pattern 1	

Table 5. Rank order of difficulty from hardest to easiest for 20 syntactic structures.

That is, those constructions that were troublesome for the norm group to whom the sentences were signed were also difficult for the CID children orally. This may mean that some sentence constructions may be hard for all deaf children to acquire no matter

the mode(s) of communication used. This could also mean that the addition of a sign language system may not help a deaf child to acquire comprehension of English syntax any easier or better than the use of only oral communication.

Item Analysis

Another factor that was investigated was the number of CID children who responded correctly to each sentence. Of the 100 test items, 25 were responded to correctly by all of the children and 54 were answered correctly by 75-99% of the children. So altogether, 79% of the sentences were responded to with more than 75% accuracy. This means that most of the sentences and pictures were not confusing to the children. Eleven items had 50-74% accuracy and only 4 had under 49% accuracy.

The next aspect of this study that was examined was whether a child could select the correct picture without really understanding the syntactic structure being tested. The fifty complex sentences and the corresponding picture selections were studied. It was determined that for 30% of these complex structures, the correct picture could be selected by a child who understood two or three key words. The following list contains the sentence and construction being evaluated for those items which do not test complex syntax. The underlined words are those for which comprehension is essential to select the correct picture. Copies of the corresponding pictures are contained in the Appendix. Comparing the sentences to the pictures should support my conclusion.

53. The boy ate lunch but the girl didn't. (Deletions)
58. The teacher says, "Open your book!" (Embedded Imperative)
60. Mother is cooking the food and the girl is setting the table. (Conjunction)
63. Mother fed the cat and father put the dog out. (Conjunction)
66. Mother says, "Come here!" (Embedded Imperative)
68. That the dog chased the car scared the girl. (Subject Complement)
70. The boy went to school and the girl stayed home. (Conjunction)

73. The girl is riding her bicycle and the boy is walking. (Conjunction)

78. The policewoman says, "Stop!" (Embedded Imperative)

80. Mother held the baby father took the picture of. (Final Relative Clause)

88. The girl likes to go swimming. (Object Complement)

90. The teacher watched the boy go out the door. (Object Complement)

92. While the dog waited the boy fixed the food. (Adverbial Clause - Initial Subordinate Clause)

96. Mother says, "Give me the ball!" (Embedded Imperative)

There were 24 total errors on these 14 sentences. Six of the sentences were responded to correctly by more than 90% of the children and all 14 were correct for 75% or more of the children. Most of the errors on these sentences were made by children who demonstrated poor comprehension of syntax. That is, children who scored less than 50% were responsible for 80% of the errors.

Language Analysis

Some of the sentence types were included by the authors to determine the strategies that hearing-impaired children use in comprehension of syntax. Many studies have investigated the importance of word order for hearing children. Results have usually shown that hearing children apply a Subject-Verb-Object word order rule in understanding sentences. Sentences that do not comply with this rule such as passives are not understood by hearing children until a later age. To investigate this the authors included five sentence types that do not follow Subject-Verb-Object order. Their names and rankings from Table 5 are: Reversible (1) and Nonreversible (12) Passives; Non-initial Subjects (3); Medial Relative Clauses (1) and Subject Complements (8). Three of these structures had top ranking for difficulty for all hearing-impaired children. This implies that structures which do not follow the Subject-Verb-Object order are difficult for hearing-impaired children to comprehend.

A point must be made regarding the high ranking for

negatives for the CID group. When the test was administered, the three items that were represented with a contraction were produced with a contraction for the children. Since n't is not as salient a cue for negation as the word not, it was felt that incorrect responses to these three items were mainly due to the children being unable to speechread or hear the contraction.

Correlations of RITLS and GAELs

The final dimension of this study to be considered is the statistical correlation of RITLS with the GAELs. The children's rankings from lowest to highest score on both tests are shown in Table 6. As can be seen, there are wide discrepancies in rank for some children, especially Child A. The relatively poor performance of Child A may be due to the fact that he is at the beginning of the youngest norm group and, at age 5-1, is being compared to a group of 5-7 year olds.

Child	Age	RITLS Rank	GAEL Rank
A	5-1	1	13
B	5-8	2	2
C	8-2	3	7
D	12-5	4	4
E	14-6	5	1
F	10-6	6	12
G	9-9	7	8
H	12-3	8	11
I	9-9	9	5
J	14-6	9	9
K	12-1	10	3
L	14-5	11	6
M	14-7	12	11
N	12-2	13	10
O	6-9	14	14
P	7-6	15	15

Table 6. Rankings from lowest to highest percentile scores on RITLS and GAELs.

Since the vast difference in ranks for Child A greatly affected the correlation between the two tests, it was calculated two times. Including Child A's score, the correlation was .53 which shows a moderate correlation between the two instruments. Without Child A's score, a much higher correlation of .69 was achieved. This means that a high correlation between syntactic comprehension and production was demonstrated in the usage of these tests.

CONCLUSIONS

It must be kept in mind that these conclusions are tentative since they are based on a study with a small sample.

The RITLS appears to be a good measure of syntactic comprehension for those children who are beyond the beginning language stages. It is an easy test to administer and score and it samples a large number of structures. The pictures and sentences are clear.

In spite of the fact that the children in the CID sample had significantly greater hearing losses than the norm group and responded to only oral input, they performed better than the norm group on this test. They had fewer errors and higher percentile scores.

The RITLS had a moderate to high correlation with the GAELs. This established the relationship between comprehension and production of syntax in deaf children.

Certain language structures, most notoriously the reversible passive, have been shown to be difficult for all hearing-impaired children who have been administered this test. This implies that using sign language to make all words and parts of words salient to hearing-impaired children does not necessarily enhance their understanding of English syntax.

BIBLIOGRAPHY

Blackwell, Peter, Elizabeth Engen, Joseph Fischgrund and Christina Zarcadoolas. 1978. Sentences and Other Systems. Washington, D.C.: A.G. Bell Association for the Deaf, Inc.

Bloom, Lois and Margaret Lahey. 1978. Language Development and Language Disorders. New York: John Wiley & Sons.

de Villiers, Jill and Peter de Villiers. 1978. Language Acquisition. Cambridge, Mass.: Harvard University Press.

Dale, Philip. 1972. Language Development. Hinsdale, Illinois: The Dryden Press Inc.

Engen, Elizabeth and Trygg Engen. 1983. Rhode Island Test of Language Structure. Baltimore: University Park Press.

Moog, Jean S. and Ann E. Geers. 1979. CID Grammatical Analysis of Elicited Language - Simple Sentence Level. St. Louis: Central Institute for the Deaf.

Moog, Jean S. and Ann E. Geers. 1980. Grammatical Analysis of Elicited Language - Complex Sentence Level. St. Louis: Central Institute for the Deaf.

APPENDIX

Item 53

Item 58

1

2

3

Item 60

1

2

3

Item 63

Item 66

1

2

3

Item 68

Item 70

1

2

3

Item 73

1

2

3

Item 78

Item 80

Item 88

Item 90

1

2

3

Item 92

1

2

3

Item 96